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EXAMINER
TSOY, ELENA

ART UNIT	PAPER NUMBER
1762	

DATE MAILED: 05/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/895,153	Applicant(s) NEOH ET AL.	
	Examiner Elena Tsoy	Art Unit 1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 March 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19,21 and 23-36* is/are pending in the application.

4a) Of the above claim(s) *23-33* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-19,21 and 34-36* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Response to Amendment

1. Amendment filed on March 20, 2003 has been entered. Claims 20, 22 have been cancelled. New claim 36 has been added. Claims 1-19, 21, 23-36 are pending in the application. Claims 24-33 are withdrawn from consideration as directed to a non-elected invention.

Election/Restrictions

2. Amended claim 23 is no longer a linking claim. Claim 23 is directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claim 23 is now a product claim of non-elected Group III, classified in class 428/500, which is, therefore, distinct from the elected invention.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claim 23 is withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Claim Objections

3. Claims 35, 36 are objected to because of the following informalities:

Claim 35, lines 1, 12, "viologen" should be changed to -- viologen salt --.

Claim 36, lines 3, 4, "a vinyl benzyl grafted" should be changed to -- a vinyl benzyl halide grafted --.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-19, 21, 23, 34, 35 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, lines 2-3, the terms "doping", "pre-doped" renders the claim indefinite because the specification does not disclose what amount of viologen salt is considered to be a "doping amount" in a polymeric material (See specification, page 5, lines 7-10). Generally, it is well known in the art that "dopant" is present in a polymer in a *minor* amount. However, upper limit of the *minor* amount varies in the art. The Examiner has looked for other uses of the term "doping amount " in polymeric material. For example, Afzali-Ardakani et al (US 5,776,370), 1998, describes "doping amount" as 5-50% per unit of a polymer material (See column 1, lines 52-58). For examining purposes the Examiner interpreted "a pre-doped composition" of claim 1 as a composition having up to 50 % of viologen salt.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. **Claims 1, 2, 10, 11, 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mikhael et al (US 6,040,017) in view Porter (US 4,211,621) for the reasons of record as set forth in Paragraph No. 7 of the Office Action mailed on December 20, 2002 (Paper No. 7).

8. **Claims 1, 2, 7-11, 15, 17-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Afzali-Ardakani et al (US 5,776,370) in view of Porter (US 4,211,621) and Rembaum (US 3,754,055) for the reasons of record as set forth in Paragraph No. 8 of the Office Action mailed on December 20, 2002 (Paper No. 7).

9. **Claims 3-6, 35** are rejected under 35 U.S.C. 103(a) as being unpatentable over Afzali-Ardakani et al (US 5,776,370) in view of Porter (US 4,211,621) and Rembaum (US 3,754,055), as applied above, further in view of Beratan et al (US 5,016,063) for the reasons of record as set forth in Paragraph No. 9 of the Office Action mailed on December 20, 2002 (Paper No. 7).

10. **Claims 12-14, 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Afzali-Ardakani et al (US 5,776,370) in view Porter (US 4,211,621) and Rembaum (US 3,754,055), as applied above, and further in view of Inata et al (US 5,068,062) for the reasons of record as set forth in Paragraph No. 10 of the Office Action mailed on December 20, 2002 (Paper No. 7).

11. **Claims 34, 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Afzali-Ardakani et al (US 5,776,370), Porter (US 4,211,621) and Rembaum (US 3,754,055), as applied above, further in view of Allemand et al (US 5,729,379) for the reasons of record as set forth in Paragraph No. 11 of the Office Action mailed on December 20, 2002 (Paper No. 7).

12. **Claim 36** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP56026977 in view of Pohl et al (US 4,455,233), Rembaum (US 3,754,055) and Beratan et al (US 5,016,063).

JP56026977 discloses a photochromic composition having high photosensitivity and film-forming activity, which can formed on a substrate such as polystyrene by attaching a viologen salt to the substrate having pendant benzyl chloride groups (benzyl chloride grafted substrate) by chloromethylating phenyl-containing substrate such as polystyrene substrate using CH_3OCH_2Cl (See formula (8) and reacting benzyl chloride groups of the chloromethylated

polystyrene substrate with 4,4' bi pyridyl mono aralkyl halide compound, and then coating the formed viologen salt with a solid alcohol such as polyvinyl alcohol for sensitizing the photoreduction of violegen salt (electron donor) (See Formula (1); Abstract).

JP56026977 fails to teach that (i) benzyl chloride groups can be grafted on a substrate other than phenyl-containing substrate such as polystyrene substrate using vinyl benzyl chloride instead of CH_3OCH_2Cl; (ii) an equimolar mixture of 4,4' bipyridine and p-xylene dihalide is used instead of 4,4' bi pyridyl mono aralkyl halide compound; (iii) instead of polyvinyl alcohol, polyaniline can be used as electron donor for coating the viologen salt layer.

As to (i), Pohl et al teach that pendant vinyl benzyl chloride groups can be easily grafted onto a substrate other than phenyl-containing substrate by irradiation the substrate in a solution of vinyl benzyl chloride (See column 8, lines 5-15).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have grafted vinyl benzyl chloride groups in JP56026977 by using substrate other than phenyl-containing substrate by irradiation the substrate in a solution of vinyl benzyl chloride since Pohl et al teach that pendant vinyl benzyl chloride groups can be easily grafted onto a substrate other than phenyl-containing substrate by irradiation the substrate in a solution of vinyl benzyl chloride.

As to (ii), Rembaum teaches that pyridine reacts with aralkylene dihalide by simple mixing (See column 2, lines 10-17). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an equimolar mixture of 4,4' bipyridine and aralkyl dihalide instead of forming a dipyridyl mono aralkyl halide compound in a method of JP56026977 with the expectation of providing the desired viologen salt-grafted substrate since Rembaum teaches that pyridine reacts with aralkylene dihalide by simple mixing.

As to (iii), Beratan et al teach that polyaniline is suitable for the use as electron donor for viologen salt acceptor (See column 6, lines 16-30).

It is held that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in Sinclair & Carroll Co. v. Interchemical Corp., 325 U.S. 327, 65 USPQ 297 (1945). See also In re Leshin, 227 F.2d 197, 125 USPQ 416 (CCPA 1960) (selection of a known plastic to make a container of a type made of plastics prior to the invention was held to be obvious); Ryco, Inc. v. Ag-Bag Corp., 857 F.2d 1418, 8 USPQ2d 1323 (Fed. Cir. 1988).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used polyaniline as a donor in JP56026977 since Beratan et al teach that polyaniline is suitable for the use as electron donor for viologen salt acceptor.

It is the Examiner's position that photoreduction of the coated photochromic composition of JP56026977 in view of Beratan et al can be performed with near-ultraviolet radiation since the structure of the coated composition of JP56026977 in view of Beratan et al is substantially identical to that of claimed invention.

13. The prior art made of record and not relied upon is considered pertinent to applicant disclosure.

Dominick et al (US 5,397,686) teaches that polyvinyl alcohol used in photochromic compositions is an electron donor (See column 3, lines 63-67).

Response to Arguments

14. Applicants' arguments filed March 20, 2003 have been fully considered but they are not persuasive.

(A) Applicants argue that a secondary reference of Porter cannot remedy Mikhael et al since Porter shows equivalency of quinones and viologen salts only for purpose of oxidative splitting of water to form hydrogen but not for polymeric materials.

The Examiner respectfully disagrees with this argument. In column 3, lines 19-22, Mikhael et al disclose that an electron acceptor dopant substance may be **any** *electrophilic organic* substance that **interacts** or complexes with **any** *electron-rich organic material*.

Porter teaches that both viologen salt and quinones are electron acceptors, which are sufficiently powerful oxidising agents to abstract electrons from the excited manganese complex (organic material). In other words, secondary reference of Porter is relied upon to show that viologen salt is also a sufficiently powerful electron acceptor substance that **interacts** with *electron-rich organic material*.

Therefore, one of ordinary skill in the art would have reasonable expectation of success of substituting one sufficiently powerful *organic* electron acceptor substance such as quinone for another sufficiently powerful *organic* electron acceptor substance such as viologen salt.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elena Tsoy whose telephone number is (703) 605-1171. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

ET

Elena Tsoy
Examiner
Art Unit 1762

May 8, 2003

MICHAEL BARR
PRIMARY EXAMINER